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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/584,634	06/26/2006	Akira Ikeda	1019519-000532	5588

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EXAMINER	
HON, SOW FUN	

ART UNIT	PAPER NUMBER
1798	

NOTIFICATION DATE	DELIVERY MODE
02/18/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ADIPFDD@bipc.com
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Office Action Summary	Application No.	Applicant(s)	
	10/584,634	IKEDA ET AL.	
	Examiner	Art Unit	
	SOPHIE HON	1798	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12/9/10*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,13,30-31,40-45,60,70-71* is/are pending in the application.

4a) Of the above claim(s) *30,31 and 40-45* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,13,60,70 and 71* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/5/10*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/09/10 has been entered.

Response to Amendment

Withdrawn Rejections

2. The 35 U.S.C. 102(b)/103(a) rejection of claims 1, 13, 60 over Matsunaga, as evidenced by Gunesin, is withdrawn due to the perfection of the claim to the foreign priority date of JP 2003-434142 with the certified English translation filed 12/09/10, the statement of common ownership under 35 U.S.C. 103(c) in the letter filed 12/09/10 and the amendment filed 12/09/10.

New Rejections

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1, 13, 60 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. There does not appear to be support in the specification of the new range of "substantially does not have a fluoroalkyl group" for the amount of fluoroalkyl group in the binder.

4. Claims 1, 13, 60 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. It is unclear how small an amount of fluoroalkyl group would meet the limitation of “substantially does not have a fluoroalkyl group”.

Claim Rejections - 35 USC § 103

5. Claims 1, 60, 70-71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsufuji (US 2002/0018886) in view of Yoshikawa (US 7,229,686), as evidenced by Gunesin (US 4,692,492).

Regarding claim 1, Matsufuji teaches an antireflection film comprising: a transparent support; and a low-refractive index layer ([0034]) having a lower refractive index than the transparent support ([0035]), wherein the low-refractive index layer can be an outermost layer of the antireflection film since the overcoat layer is optional (may be provided, [0250]), wherein the low-refractive index layer comprises a binder which is a polymer of a monomer having two or more ethylenic unsaturated groups being an ester of a polyalcohol and a (meth)acrylic acid, wherein the binder does not have a fluoroalkyl group ([0239]). Matsufuji teaches that the low-refractive index layer comprises a porous silica particle (silicon oxide particles become porous, [0200]) which can be a hollow one, as evidenced by Yoshikawa.

Yoshikawa teaches that a hollow silica particle is commercially available for use in a low-refractive index layer (column 10, lines 22-28) of an antireflection film (column 10, lines 40-41).

Matsufuji fails to teach a silicone compound comprising a (meth)acryloyl group in the low-refractive index layer that lowers a surface free energy of the antireflection film.

However, Matsufuji teaches that a silicone compound containing a polymerizable group can be disposed at the outer surface of the low-refractive layer as the outermost

layer, to lower the surface energy of the outermost layer for the purpose of providing the desired stain-proofing (anticontamination, [0284]).

Yoshikawa teaches that a silicone compound comprising a (meth)acryloyl group $(R^1(CH_3)_2SiO(R^1CH_3SiO)_9(R^6CH_3SiO)Si(CH_3)_2R^1$, column 7, lines 10-14, R^6 is methacryloxypropyl, column 7, line 22) is added to the low-refractive index layer (Component (C) is especially suited for use with component (D), column 5, lines 57-65, component (D) serves to impart a low refractive index function and is silica-base inorganic oxide fine particles having void in the interior, column 4, lines 47-50). The silicone compound has a trimethyl siloxy terminal group ($(CH_3)_2SiO$, column 7, lines 10-14) which is expected to have a low enough surface free energy to diffuse to the outer surface of the low-refractive index layer and segregate there, and hence lower a surface free energy of the antireflection film, as evidenced by Gunesin.

Gunesin teaches that a silicone compound with low surface free energy (PDMS with a trimethyl siloxy terminal group has a surface free energy of about 21 dyne/cm, column 4, lines 54-60) will diffuse to an outer surface of a layer and segregate there (forming a thin permanent coating, column 4, lines 58-63), lowering the surface free energy of the outer surface of the layer, for the purpose of providing the outer surface of the layer with stain-proofing (non-stick and non-staining coating, column 4, lines 53-68).

Thus, in the absence of a showing to the contrary, the silicone compound of Matsufuji, as modified by Yoshikawa, is expected to be segregated at the outer surface of the low refractive index layer such that a spectral intensity ratio Si/C in a photoelectron spectrum at the outer surface is larger by at least 5 times than that at a

depth from the outer surface, the depth being equal to 80% of a thickness of the low refractive index layer.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have added a silicone compound comprising a (meth)acryloyl group to the low-refractive index layer of the antireflection film of Matsufuji, which segregates at the outer surface of the low-refractive index layer to lower the surface free energy of the film, in order to obtain the desired stain-proofing, as taught by Yoshikawa in light of Gunesin.

Regarding claim 60, Matsufuji teaches an antireflection film comprising: a transparent support; and a low-refractive index layer ([0034]) having a lower refractive index than the transparent support ([0035]), wherein the low-refractive index layer can be an outermost layer of the antireflection film since the overcoat layer is optional (may be provided, [0250]), wherein the low-refractive index layer comprises a binder which is a polymer of a monomer having two or more ethylenic unsaturated groups being an ester of a polyalcohol and a (meth)acrylic acid, wherein the binder does not have a fluoroalkyl group ([0239]). Matsufuji teaches that the low-refractive index layer comprises a porous silica particle (silicon oxide particles become porous, [0200]) which can be a hollow one, as evidenced by Yoshikawa.

Yoshikawa teaches that a hollow silica particle is commercially available for use in a low-refractive index layer (column 10, lines 22-28) of an antireflection film (column 10, lines 40-41).

Matsufuji fails to teach a silicone compound comprising a (meth)acryloyl group in the low-refractive index layer that lowers a surface free energy of the antireflection film.

However, Matsufuji teaches that a silicone compound containing a polymerizable group can be disposed at the outer surface of the low-refractive layer as the outermost layer, to lower the surface energy of the outermost layer for the purpose of providing the desired stain-proofing (anticontamination, [0284]).

Yoshikawa teaches that a silicone compound comprising a (meth)acryloyl group $(R^1(CH_3)_2SiO(R^1CH_3SiO)_9(R^6CH_3SiO)Si(CH_3)_2R^1$, column 7, lines 10-14, R^6 is methacryloxypropyl, column 7, line 22) is added to the low-refractive index layer (Component (C) is especially suited for use with component (D), column 5, lines 57-65, component (D) serves to impart a low refractive index function and is silica-base inorganic oxide fine particles having void in the interior, column 4, lines 47-50). The silicone compound has a trimethyl siloxy terminal group ($(CH_3)_2SiO$, column 7, lines 10-14) which is expected to have a surface free energy that is within a range of at most 25 nN/m, that is low enough to diffuse to the outer surface of the low-refractive index layer and segregate there, and hence lower a surface free energy of the antireflection film to one that is within a range of at most 25 nN/m, as evidenced by Gunesin.

Gunesin teaches that a silicone compound with a trimethoxy siloxy terminal group having a low surface energy of about 21 mN/m (PDMS with a trimethyl siloxy terminal group has a surface free energy of about 21 dyne/cm, column 4, lines 54-60) which is within the claimed range of at most 25 mN/m, will diffuse to an outer surface of a layer and segregate there (forming a thin permanent coating, column 4, lines 58-63),

lowering the surface free energy of the outer surface of the layer, for the purpose of providing the outer surface of the layer with stain-proofing (non-stick and non-staining coating, column 4, lines 53-68).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have added a silicone compound comprising a (meth)acryloyl group to the low-refractive index layer of the antireflection film of Matsufuji, which segregates at the outer surface of the low-refractive index layer to lower the surface energy of the film to one that is within a range of at most 25 mN/m, in order to obtain the desired stain-proofing, as taught by Yoshikawa in light of Gunesin.

Regarding claim 70, Matsufuji teaches an antireflection film comprising: a transparent support; and a low-refractive index layer ([0034]) having a lower refractive index than the transparent support ([0035]), wherein the low-refractive index layer can be an outermost layer of the antireflection film since the overcoat layer is optional (may be provided, [0250]), wherein the low-refractive index layer comprises a porous silica particle (silicon oxide particles become porous, [0200]) which can be a hollow one, as evidenced by Yoshikawa.

Yoshikawa teaches that a hollow silica particle is commercially available for use in a low-refractive index layer (column 10, lines 22-28) of an antireflection film (column 10, lines 40-41).

In addition, Matsufuji teaches that the low-refractive index layer comprises a binder which consists of a polymer of a monomer having two or more ethylenic unsaturated groups which consists of ethylene glycol di(methacrylate), pentaerythritol

tetra(meth)acrylate, pentaerythritol tri(meth)acrylate, trimethylolpropane tri(meth)acrylate, trimethylolethane tri(meth)acrylate, dipentaerythritol tetra(meth)acrylate, dipentaerythritol penta(meth)acrylate, dipentaerythritol hexa(meth)acrylate, polyurethane polyacrylate, or polyester polyacrylate ([0239]). Matsufuji fails to teach a silicone compound comprising a (meth)acryloyl group in the low-refractive index layer that lowers a surface free energy of the antireflection film.

However, Matsufuji teaches that a silicone compound containing a polymerizable group can be disposed at the outer surface of the low-refractive layer as the outermost layer, to lower the surface energy of the outermost layer for the purpose of providing the desired stain-proofing (anticontamination, [0284]).

Yoshikawa teaches that a silicone compound comprising a (meth)acryloyl group $(R^1(CH_3)_2SiO(R^1CH_3SiO)_9(R^6CH_3SiO)Si(CH_3)_2R^1$, column 7, lines 10-14, R^6 is methacryloxypropyl, column 7, line 22) is added to the low-refractive index layer (Component (C) is especially suited for use with component (D), column 5, lines 57-65, component (D) serves to impart a low refractive index function and is silica-base inorganic oxide fine particles having void in the interior, column 4, lines 47-50). The silicone compound has a trimethyl siloxy terminal group ($(CH_3)_2SiO$, column 7, lines 10-14) which is expected to have a low enough surface free energy to diffuse to the outer surface of the low-refractive index layer and segregate there, and hence lower a surface free energy of the antireflection film, as evidenced by Gunesin.

Gunesin teaches that a silicone compound with low surface free energy (PDMS with a trimethyl siloxy terminal group has a surface free energy of about 21 dyne/cm,

column 4, lines 54-60) will diffuse to an outer surface of a layer and segregate there (forming a thin permanent coating, column 4, lines 58-63), lowering the surface free energy of the outer surface of the layer, for the purpose of providing the outer surface of the layer with stain-proofing (non-stick and non-staining coating, column 4, lines 53-68).

Thus, in the absence of a showing to the contrary, the silicone compound of Matsufuji, as modified by Yoshikawa, is expected to be segregated at the outer surface of the low refractive index layer such that a spectral intensity ratio Si/C in a photoelectron spectrum at the outer surface is larger by at least 5 times than that at a depth from the outer surface, the depth being equal to 80% of a thickness of the low refractive index layer.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have added a silicone compound comprising a (meth)acryloyl group to the low-refractive index layer of the antireflection film of Matsufuji, which segregates at the outer surface of the low-refractive index layer to lower the surface free energy of the film, in order to obtain the desired stain-proofing, as taught by Yoshikawa in light of Gunesin.

Regarding claim 71, Matsufuji teaches that the binder consists of a polymer of a monomer having two or more ethylenic unsaturated groups which consists of ethylene glycol di(methacrylate), pentaerythritol tetra(meth)acrylate, pentaerythritol tri(meth)acrylate, trimethylolpropane tri(meth)acrylate, trimethylolethane tri(meth)acrylate, dipentaerythritol tetra(meth)acrylate, dipentaerythritol

penta(meth)acrylate, dipentaerythritol hexa(meth)acrylate, polyurethane polyacrylate, or polyester polyacrylate ([0239]).

6. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsufuji in view of Yoshikawa and Gunesin, as applied to claims 1, 60, 70-71 above, and further in view of Nakamura (US 2003/0077437).

Matsufuji, as modified by Yoshikawa and Gunesin, teaches the antireflection film described above. In addition, Matsufuji teaches that the antireflection film comprises a layer comprising a hydrolysate of an organosilane ([0218]) produced in the presence of at least one of an acid catalyst and a metal chelate compound ([0219]). Matsufuji teaches that the organosilane can be an alkyl orthosilicate used for the purpose of providing the desired coupling (methyl orthosilicate, [0218]) but fails to teach an example that is represented by formula (A) of Applicant.

However, Nakamura teaches that a hydrolysate of an alkyl orthosilicate (hydrolyzed product thereof, [0097]) can be used in combination with an organosilane that is represented by formula (A) of Applicant, (Ia, [0083]) where m of Applicant = 1, R^1 = R^{10} of Applicant = substituted or unsubstituted alkyl group, or a substituted or unsubstituted aryl group, R^4O = OR^3 = OR^2 = X of Applicant = hydrolyzable alkoxy group, for the purpose of providing the desired combination of coupling characteristics ([0096]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have combined an organosilane represented by formula (A) of Applicant, with the organosilane in a layer of the antireflection film of

Matsufuji, in order to obtain the desired combination of coupling characteristics, as taught by Nakamura.

Response to Arguments

7. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number (571)272-1492. The examiner can normally be reached Monday to Friday from 10:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Angela Ortiz, can be reached at (571)272-1206. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Sophie Hon/

Sow-Fun Hon

Primary Examiner, Art Unit 1798